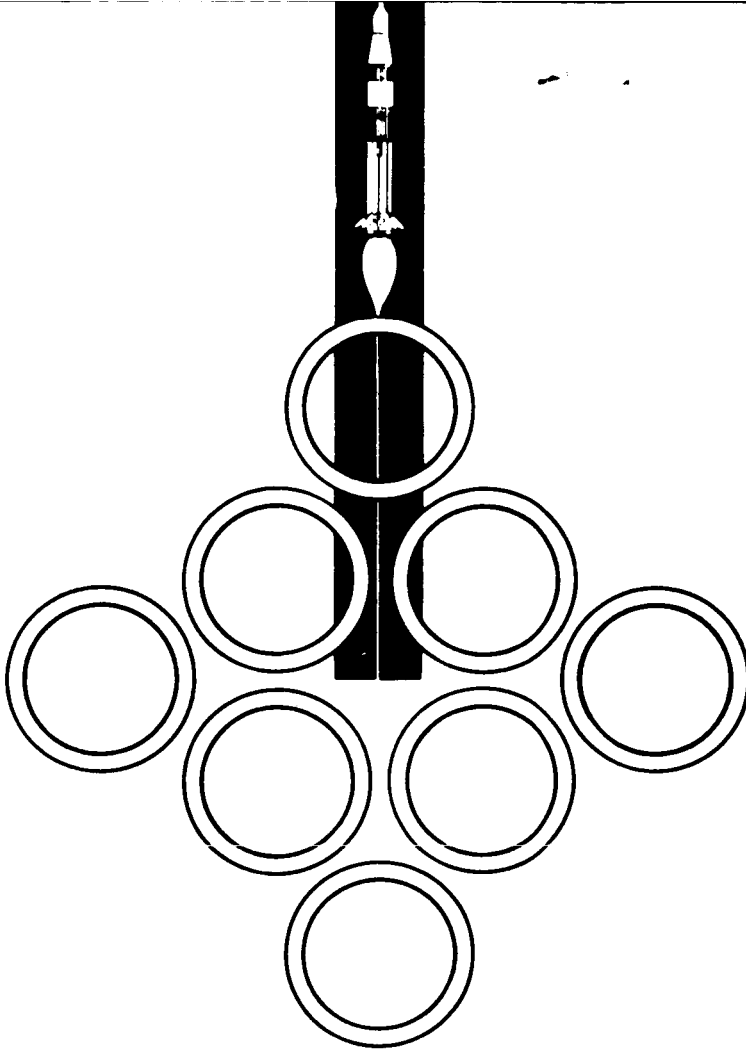


SJIF

ENGINEERING DEPARTMENT  
TECHNICAL REPORT

TR-RE-CCSD-FO-1092-3



SATURN IB PROGRAM

TEST REPORT  
FOR

FLEXIBLE HOSE, 3/4-INCH I.D., 3000-PSIG

Aeroquip Corporation Part Number AE700480-20

NASA Drawing Number 75ML2944 FFH-20

N67-25868

(ACCESSION NUMBER)

48

(PAGES)

CR-83850

(NASA CR OR TMX OR AD NUMBER)

(THRU)

(CODE)

(CATEGORY)

FACILITY FORM 602

SPACE DIVISION



CHRYSLER  
CORPORATION

TEST REPORT  
FOR  
FLEXIBLE HOSE, 3/4-INCH I.D., 3000-PSIG  
Aeroquip Corporation Part Number AE700480-20  
NASA Part Number 75ML2944 FFH-20

ABSTRACT

This report presents the results of tests performed on one specimen of Flexible Hose 75ML2944 FFH-20. The following tests were conducted:

- |                         |                     |
|-------------------------|---------------------|
| 1. Receiving Inspection | 5. High Temperature |
| 2. Proof Pressure       | 6. Surge            |
| 3. Functional           | 7. Cycle            |
| 4. Low Temperature      | 8. Burst            |

Expansion of the teflon inner hose occurred during the functional test and the surge test. The overall length of the specimen increased from a pretest length of 110 inches to a post-test length of 110-3/8 inches. However, these physical changes did not impair the performance of the specimen.

The results of the tests were satisfactory. The performance of the specimen was in accordance with specification requirements.

TEST REPORT

FOR

FLEXIBLE HOSE, 3/4-INCH I.D., 3000-PSIG

Aeroquip Corporation Part Number AE700480-20

NASA Part Number 75ML2944 FFH-20

November 15, 1966

CHRYSLER CORPORATION SPACE DIVISION - NEW ORLEANS, LOUISIANA

## FOREWORD

The tests reported herein were conducted for the John F. Kennedy Space Center by Chrysler Corporation Space Division (CCSD). New Orleans. Louisiana. This document was prepared by CCSD under contract NAS8-4016, Part VII, CWO 271620.



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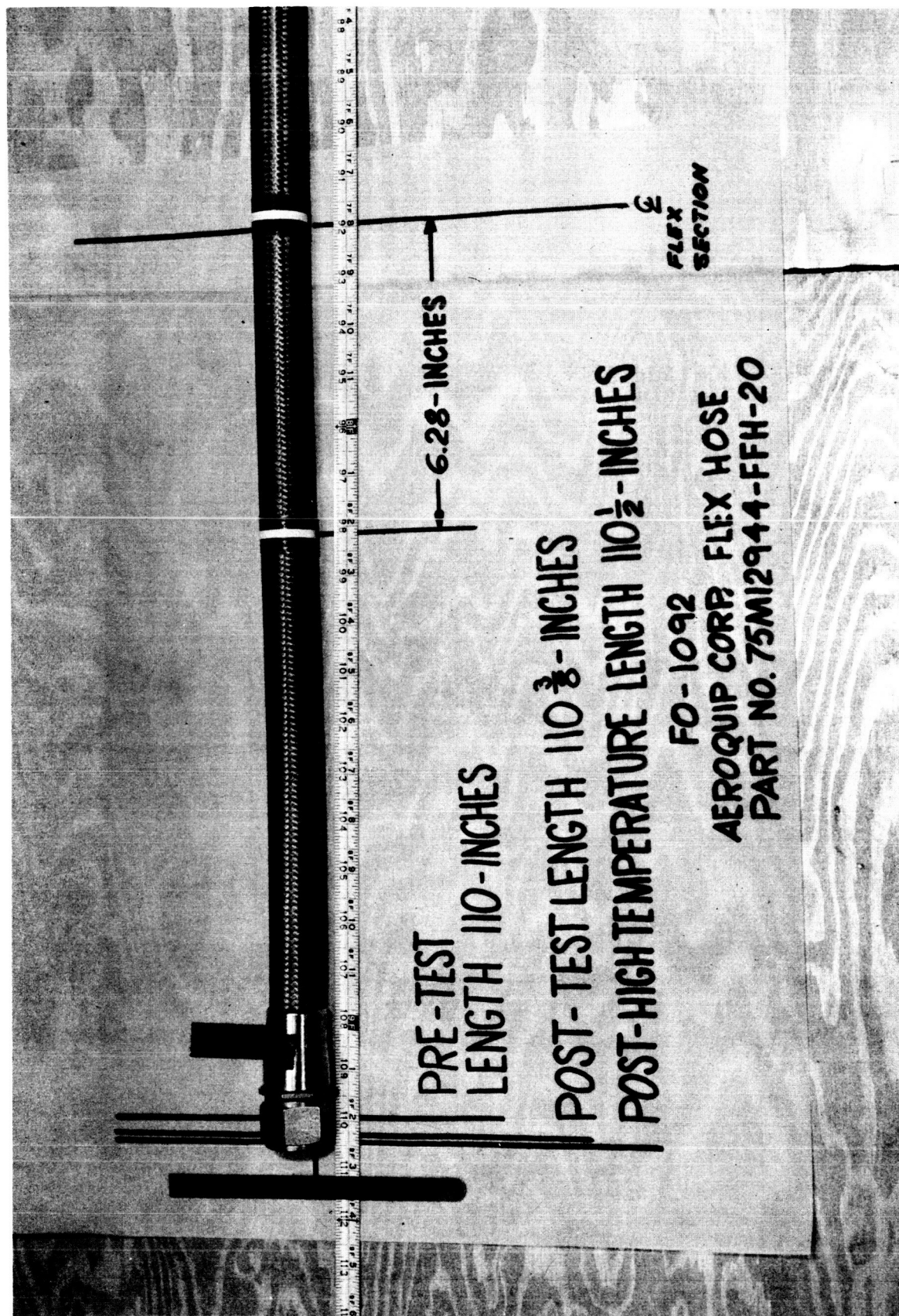
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Flexible Hose, 3/4-inch I.D., 3000-psig

CHECK SHEET

FOR

FLEXIBLE HOSE

3/4-INCH I.D., 3000-PSIG

MANUFACTURER: Aeroquip Corporation, Jackson, Michigan

MANUFACTURER'S MODEL NUMBER: AE7004080-20

NASA PART NUMBER: 75M12944 FFH-20

TESTING AGENCY: Chrysler Corporation Space Division, New Orleans, Louisiana

AUTHORIZING AGENCY: NASA KSC

I. FUNCTIONAL REQUIREMENTS

- A. OPERATING MEDIUM: Gaseous nitrogen
- B. OPERATING PRESSURE: 3000 psig
- C. BEND RADIUS: 8 inches minimum

II. CONSTRUCTION

- A. INNER TUBE: Extruded teflon
- B. OUTER LINER: 304 or 307 stainless wire braid
- C. END CONNECTIONS: 304 or 307 stainless steel

III. ENVIRONMENTAL REQUIREMENTS

- A. TEMPERATURE RANGE: 5°F to +125°F

IV. LOCATION AND USE

The flexible hose is used in the gaseous nitrogen line of the space-craft support piping.

# TEST SUMMARY

FLEXIBLE HOSE 75ML2944 FFH-20

Environment	Units	Operational Boundary	Test Objective	Test Results	Remarks
Receiving Inspection	1	Visual examination	To determine if specimen conforms with applicable drawings and specifications	Satisfactory	Length: 110 inches ( $\pm 0.002$ ) O.D.: 1.057 inches
Proof Pressure Test	1	4500 psig for 15 minutes	Maintain 4500 psig	Satisfactory	Maintained 4500 psig. No leakage.
Functional Test	1	8-inch minimum bend radius	Achieve 8-inch minimum bend radius	Satisfactory	Achieved 8-inch minimum radius
		Pressurize to 3000 psig	No leakage allowed	Satisfactory	No leakage in water test
Low Temperature Test	1	Stabilize specimen at 5°F, perform a functional test at low temperature, and return to ambient conditions	Determine operating ability at low temperature and after return to ambient conditions	Satisfactory	No leakage in pressure test
High Temperature Test	1	Stabilize specimen at 125°F for 72 hours, perform a functional test at high temperature, and after return to ambient conditions	Determine operating ability at high temperature and after return to ambient conditions	Satisfactory	5-psig pressure drop due to test system. No leakage in water test

# TEST SUMMARY (Continued)

FLEXIBLE HOSE 75M12944 FFH-20

Environment	Units	Operational Boundary	Test Objective	Test Results	Remarks
Surge Test	1	3000-psig pressure within 100 milliseconds for 25 cycles	Determine performance of specimen in rapidly changing pressure environment	Satisfactory	Pressurization time between 102 and 118 milliseconds caused by expansion of specimen
Cycle Test	1	Bend specimen from the extended position to the flexed position to the extended position. Perform 1000 cycles	Perform a functional test after 50,100,500, and 1000 cycles. Check for leakage	Satisfactory	No leakage in water test
Burst Test	1	12,000 psig for 30 minutes. Increase pressure to failure	Maintain 12,000 psig with no leakage for 30 minutes. Determine burst pressure	Satisfactory	12,000 psig was maintained for 30 minutes with no detectable leakage. Burst pressure was 19,500 psig

## SECTION I

### INTRODUCTION

#### 1.1 SCOPE

This report presents the results of tests that were performed to determine if flexible hose 75ML2944 FFH-20 meets the operational and environmental requirements of the John F. Kennedy Space Center. A summary of the test results is presented on page viii.

#### 1.2 ITEM DESCRIPTION

1.2.1 One specimen of flexible hose 75ML2944 FFH-20 was tested. The hose is a flexible hose, 9 feet in length, with a 3/4-inch inside diameter. The hose is manufactured by the Aeroquip Corporation, Jackson, Michigan, and serves as a  $\text{GN}_2$  supply connection in the spacecraft support nitrogen piping system.

1.2.2 The hose consists of two tubes with the inner tube consisting of 3/4-inch inside diameter extruded teflon and the outer tube of 304 or 347 stainless wire braid. The wire braid is installed over the outside of the teflon tube.

#### 1.3 APPLICABLE DOCUMENTS

The following documents contain the test requirements for flexible hose 75ML2944 FFH-20:

- a. KSC-STD-164 (D), Standard Environmental Test Methods for Ground Support Equipment Installations at Cape Kennedy
- b. NASA Drawing 75ML2944 FFH-20
- c. Cleaning Standard
- d. Test Plan CCSD-FO-1092-1F



## SECTION II

### RECEIVING INSPECTION

#### 2.1 TEST REQUIREMENTS

The specimen shall be visually and dimensionally inspected for conformance with the applicable specifications prior to testing.

#### 2.2 TEST PROCEDURE

A visual and dimensional inspection was performed to determine compliance with NASA drawing 75M12944 FFH-20 and the applicable vendor drawing to the extent possible without disassembly of the test specimen. At the same time the test specimen was also inspected for poor workmanship and manufacturing defects.

#### 2.3 TEST RESULTS

The specimen was found to conform with all applicable drawings and specifications.

#### 2.4 TEST DATA

The data determined by the inspection are as follows:

- a. Length (overall): 110 inches
- b. Length (collar to collar): 108 inches
- c. Diameter (mean outside): 1.057 ( $\pm 0.002$ ) inches
- d. End Connections MS 33656

SECTION III  
PROOF PRESSURE TEST

3.1        TEST REQUIREMENTS

- 3.1.1       The test specimen shall be hydrostatically pressurized to 4500 psig for a period of 15 minutes.
- 3.1.2       The test specimen shall be inspected for leakage and distortion.

3.2        TEST PROCEDURE

- 3.2.1       The test setup was assembled as shown in figures 3-1 and 3-2 using the equipment listed in table 3-1. All hand valves were closed.
- 3.2.2       Hand valve 4 and pressure cap 7 were opened. Hand pump 3 was operated to purge the system and specimen of air.
- 3.2.3       Pressure cap 7 was closed and the specimen was pressurized to 4500 psig using hand pump 3. The pressure indicated on gage 5 was monitored.
- 3.2.4       Hand valve 4 was closed and the pressure was maintained for 15 minutes.
- 3.2.5       The specimen was checked for leakage during this 15-minute period by monitoring gage 5 for an indication of a pressure drop at the specimen. The initial and final pressures were recorded.
- 3.2.6       Valve 6 was opened and the system and specimen were depressurized.
- 3.2.7       The specimen was removed from the test setup and inspected for distortion.

3.3        TEST RESULTS

There was no leakage of the test specimen, and no distortion was evident.

3.4        TEST DATA

The test data presented in table 3-2 were recorded during the test.

Table 3-1. Proof Pressure and Burst Test Equipment List

Item No.	Item	Manufacturer	Model/ Part No.	Serial No.	Remarks
1	Test Specimen	Aeroquip Corp.	AE7004-8020	--	3/4-inch I.D. flex hose
2	Reservoir	CCSD	--	--	H <sub>2</sub> O
3	Hand Pump	Sprague Engineering Corp.	--	300-16-64	5000-psig
4	Hand Valve				1/4-inch
5	Pressure Gage	Ashcroft	--	--	0-to 5000-psig ±1.0% FS accuracy
6	Hand Valve	Aminco	44-13106	--	1/4-inch
7	Pressure Cap	--	--	--	3/4-inch AN

Table 3-2. Proof Pressure Test Data

Pressure:	4500 psig for 15 minutes
Leakage:	None
Distortion:	None

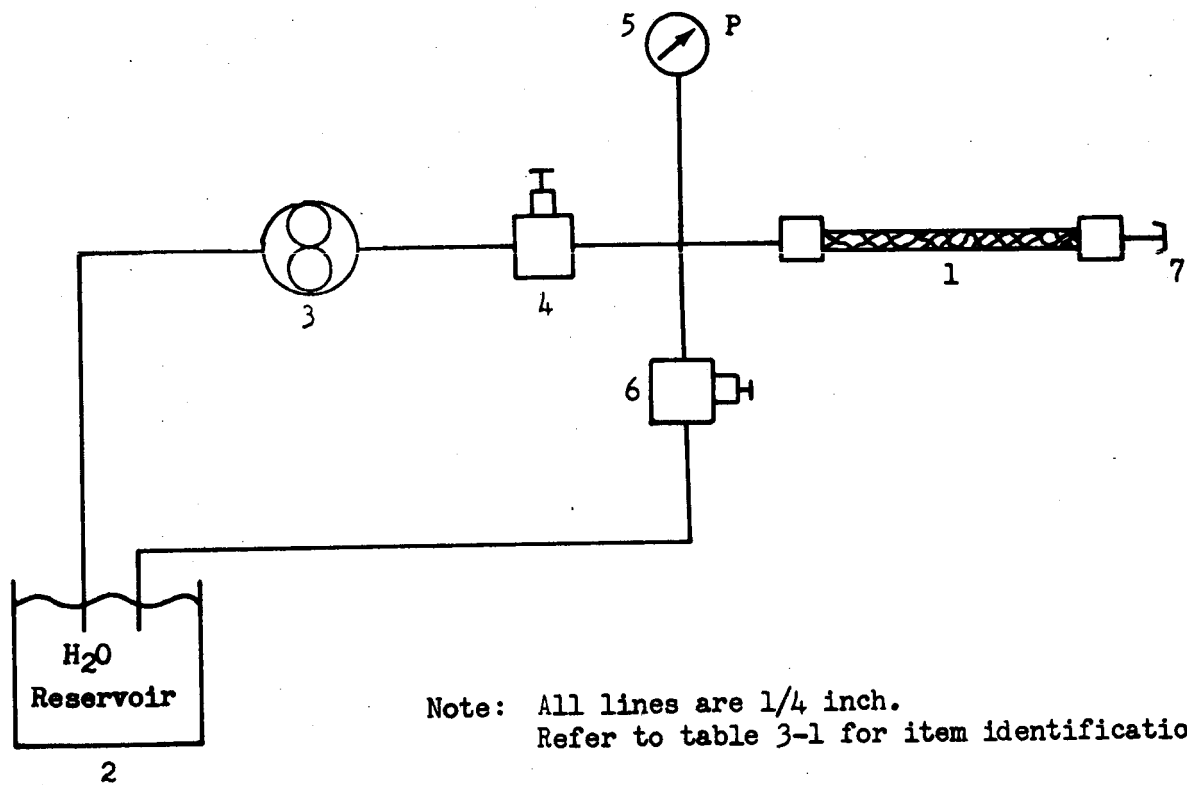


Figure 3-1. Proof Pressure and Burst Test Schematic

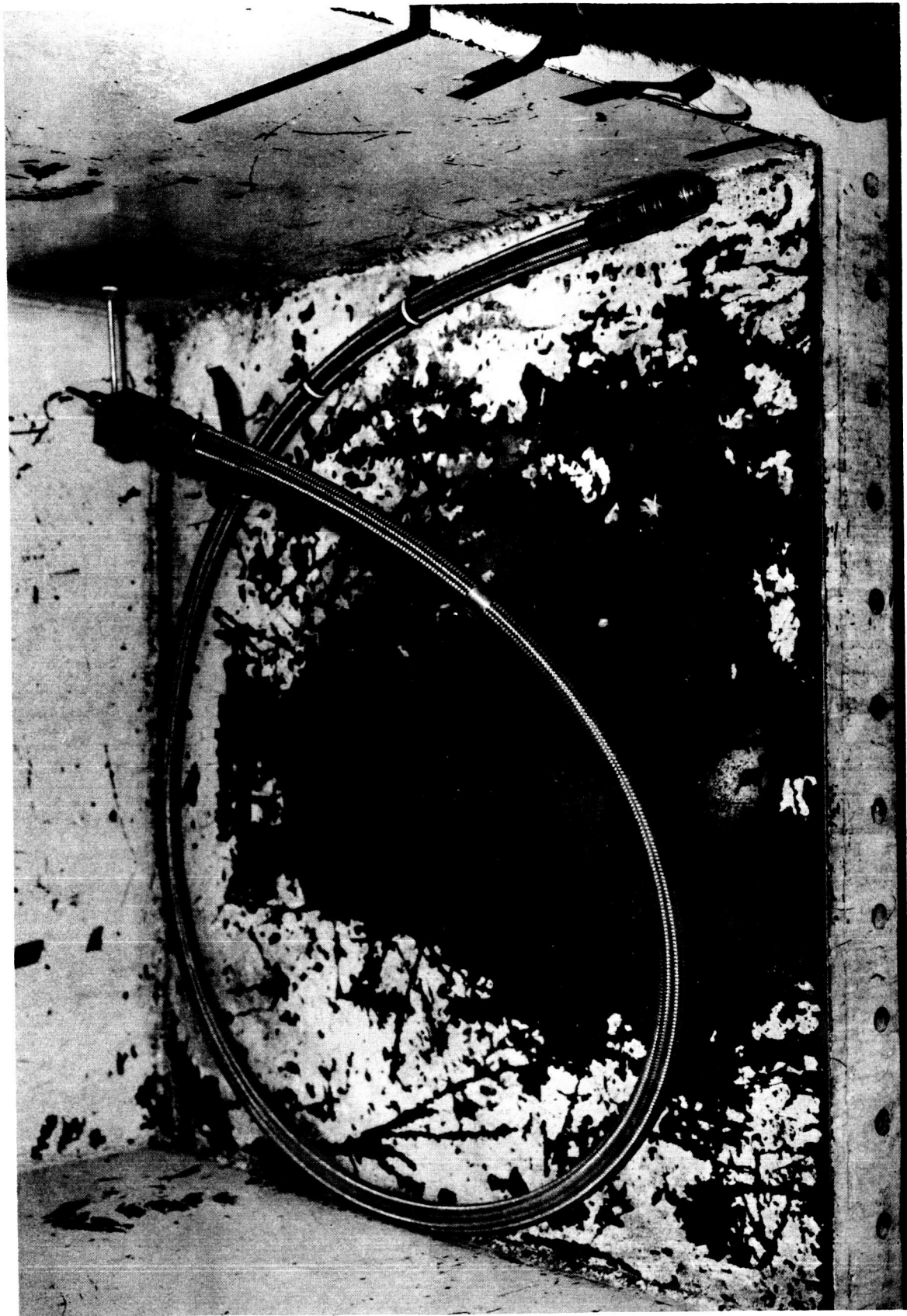


Figure 3-2. Proof Pressure and Burst Test Setup

SECTION IV  
FUNCTIONAL TEST

4.1        TEST REQUIREMENTS

- 4.1.1       One end of the test specimen shall be bent to an angle of 90 degrees. A minimum bend radius of 8 inches shall be confirmed.
- 4.1.2       The test specimen shall be pressurized with GN<sub>2</sub> to 3000 psig while in the flex position described in 4.1.1. The test specimen shall be checked for leakage. No leakage is allowed.
- 4.1.3       The test specimen shall be depressurized, then returned to the extended position.

4.2        TEST PROCEDURE

- 4.2.1       The test setup was assembled as shown in figure 4-1 installation A, using the equipment listed in table 4-1. All valves were closed.
- 4.2.2       The test specimen was bent 90 degrees from the extended position shown in figure 4-1 installation A to the flexed position shown in figure 4-1 installation B. A minimum bend radius of 8 inches was confirmed. Figure 4-2 shows the hose in the flexed position.
- 4.2.3       Test chamber 10 was filled with water.
- 4.2.4       Valve 5 was opened and the inlet port of regulator 7 was pressurized to 3500 psig with GN<sub>2</sub> from pressure source 2. The pressure was monitored on gage 6.
- 4.2.5       Hand valve 8 was opened. Regulator 7 was adjusted to pressurize the specimen to 3000 psig for 5 minutes. The pressure was monitored on gage 9.
- 4.2.6       The specimen was checked for leakage by monitoring test chamber 10 for the presence of bubbles.
- 4.2.7       The water was removed from test chamber 10.
- 4.2.8       Hand valve 5 was closed and the system and specimen were vented to zero psig by closing regulator 7. The specimen was then returned to the extended position.

4.3        TEST RESULTS

- 4.3.1       A minimum bend radius of 8 inches was achieved as specified in 4.1.1 .

4.3.2 During initial pressurization of the specimen to 3000 psig, bubbles were observed in the test chamber water; however, this was attributed to the expansion of the teflon inner hose which caused the air trapped between the inner hose and outer casing to leak through the wire braid. The specimen was pressurized two more times in the same manner and the bubbles did not appear either time.

4.3.3 No leakage was detected during the functional test.

4.4 TEST DATA

Data recorded during the functional test are presented in table 4-2.

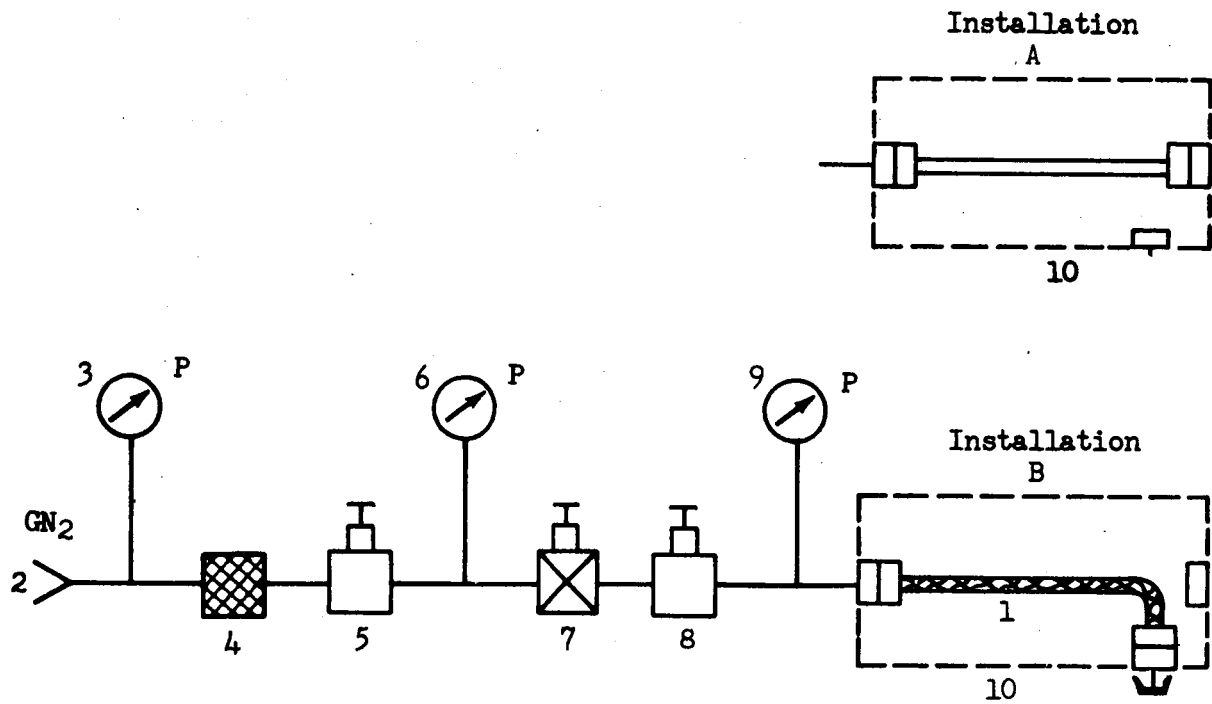
Table 4-1. Functional Test Equipment List

Item No.	Item	Manufacturer	Model/ Part No.	Serial No.	Remarks
1	Test Specimen	Aeroquip Corp.	AE700-480-20	--	3/4-inch I.D. flex hose
2	Pressure Source	--	--	--	GN <sub>2</sub> 0-to 3500-psig
3	Pressure Gage	Ashcroft	--	--	0-to 5000-psig ±1.0% FS accuracy
4	Filter	--	--	--	10-micron
5	Hand Valve	Robbins Aviation Inc.	SSNA250-4T	--	1/4-inch
6	Pressure Gage	Ashcroft	--	20617-5	0-to 5000-psig ±1.0% FS accuracy
7	Pressure Regulator	Tescom Corp.	25-1003	322	
8	Hand Valve	Robbins Aviation Inc.	SSNA-250-4T	--	1/4-inch
9	Pressure Gage	Heise	--	H35833	0-to 3500-psig ±1.0% FS accuracy
10	Test Chamber	CCSD	--	--	



Table 4-2. Functional Test Data

Trial No.	Position	Bend Radius (inches)	Pressure (psig)	Time (minutes)	Leakage	Temperature (°F)
1	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
2	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
3	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80



Note: All lines are 1/4 inch.  
Refer to table 4-1 for item identification.

Figure 4-1. Functional Test Schematic

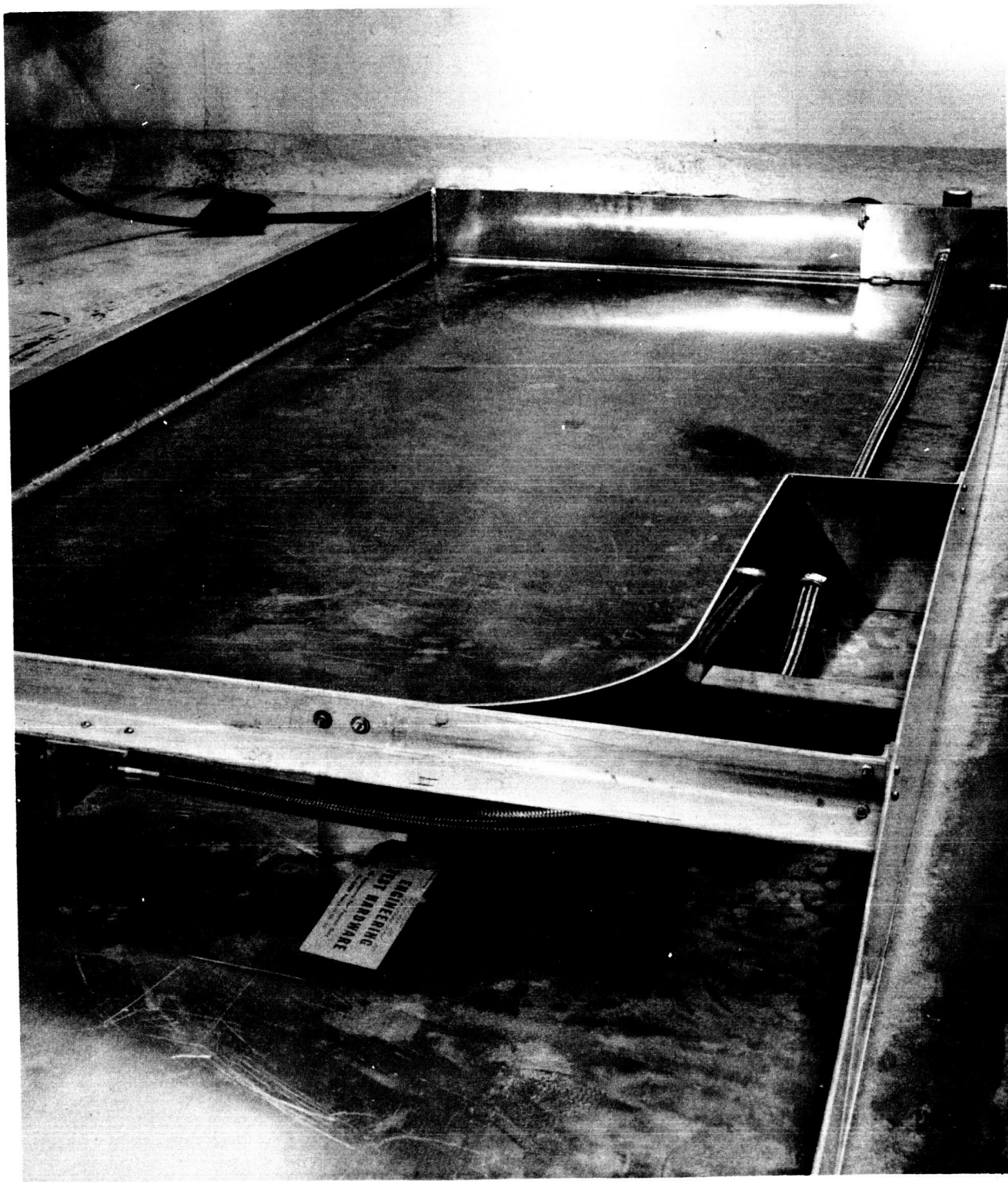


Figure 4-2. Functional Test Setup

## SECTION V

### LOW TEMPERATURE TEST

#### 5.1 TEST REQUIREMENTS

- 5.1.1 The test specimen shall be subjected to a low temperature test of 5 (+0, -4)°F to determine whether the environment causes degradation or deformation.
- 5.1.2 A functional test as prescribed in section IV shall be performed during this test with the following exceptions. The specimen will not be submerged in water. Leakage will be monitored by noting pressure drop.

#### 5.2 TEST PROCEDURE

- 5.2.1 The test specimen was placed in a low temperature chamber and installed as shown in figure 4-1 installation A. Figure 5-1 also shows the test setup.
- 5.2.2 The chamber was controlled to the specified test conditions, and a relative humidity between 60 and 90 per cent was maintained.
- 5.2.3 A functional test (refer to paragraph 5.1.2) was performed when temperature stabilization was obtained. Temperature stabilization is defined as a maximum temperature change rate of 1°F per minute as determined from the instrumentation monitoring the test item.
- 5.2.4 The chamber temperature was returned to ambient conditions upon completion of the functional test.
- 5.2.5 The test specimen was visually inspected and functionally tested within 1 hour following the return to ambient conditions.

#### 5.3 TEST RESULTS

Results of the low temperature test and associated functional tests were satisfactory. No leakage was detected.

#### 5.4 TEST DATA

Test data recorded during and after the low temperature test are presented in tables 5-1 and 5-2, respectively.

Table 5-1. Functional Test Data Obtained During Low Temperature Test

Trial No.	Position	Bend Radius (inches)	Pressure (psig)	Time (minutes)	Leakage	Temperature (°F)
1	Extended	---	0	---	---	+5
	Flexed	8	3000	5	None	+5
2	Extended	---	0	---	---	+5
	Flexed	8	3000	5	None	+5
3	Extended	---	0	---	---	+5
	Flexed	8	3000	5	None	+5

Table 5-2. Functional Test Data Obtained After Low Temperature Test

Trial No.	Position	Pend Radius (inches)	Pressure (psig)	Time (minutes)	Leakage	Temperature (°F)
1	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
2	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
3	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80

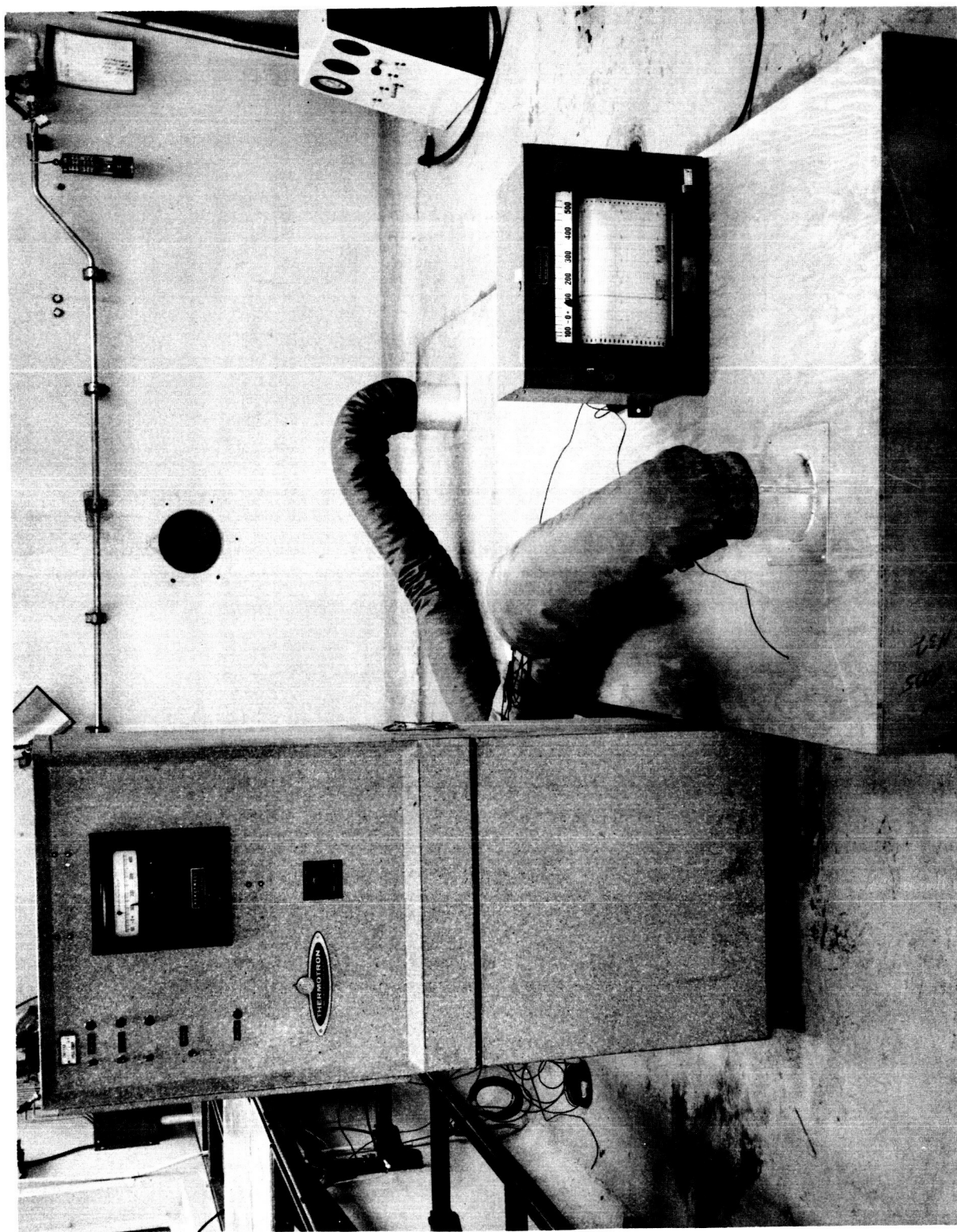


Figure 5-1. Low and High Temperature Test Setup

## SECTION VI

### HIGH TEMPERATURE TEST

#### 6.1 TEST REQUIREMENTS

- 6.1.1 The test specimen shall be subjected to a high temperature test of 125 (+4, -0)°F to determine whether the environment causes degradation or deformation.
- 6.1.2 A functional test shall be performed during this test.

#### 6.2 TEST PROCEDURE

- 6.2.1 The test specimen was placed in a high temperature chamber and installed as shown in figure 4-1 installation A. Figure 5-1 also shows the test setup.
- 6.2.2 The chamber was controlled to the specified test conditions, and a relative humidity of 20 (±5) per cent was maintained.
- 6.2.3 A temperature of 125(+4, -0)°F was maintained for a period of 72 (+2, -0) hours.
- 6.2.4 A functional test was conducted while the chamber temperature was maintained.
- 6.2.5 The chamber temperature was returned to ambient conditions upon completion of the functional test.
- 6.2.6 The specimen was visually inspected and functionally tested within 1 hour following the establishment of ambient conditions.

#### 6.3 TEST RESULTS

- 6.3.1 There was no detectable leakage of the specimen during the test. However, during the initial pressurization period, a drop in specimen pressure of 5 psig was observed. In order to determine the location of the leak, the specimen was returned to room ambient conditions and the test chamber filled with water at 85°F. The specimen was pressurized to 3000 psig and this pressure was maintained for 15 minutes. There was no detectable leakage of the specimen, but a gage monitoring the pressure indicated a drop of 5 psig. It was concluded that the leakage was in the test system, but the leak was so minute that its location could not be detected immediately. At this time the specimen was measured and its length was 110.5 inches. The high temperature test was continued.
- 6.3.2 The results of the high temperature test and associated functional tests were satisfactory. No leakage was detected.



6.4

TEST DATA

Data recorded during and after high temperature testing are presented in tables 6-1 and 6-2, respectively.

Table 6-1. Functional Test Data Obtained During High Temperature Test

Trial No.	Position	Bend Radius (inches)	Pressure (psig)	Time (minutes)	Leakage	Temperature (°F)
1	Extended	---	0	---	---	+125
	Flexed	8	3000	5	None	+125
2	Extended	---	0	---	---	+125
	Flexed	8	3000	5	None	+125
3	Extended	---	0	---	---	+125
	Flexed	8	3000	5	None	+125

Table 6-2. Functional Test Data Obtained After High Temperature Test

Trial No.	Position	Bend Radius (inches)	Pressure (psig)	Time (minutes)	Leakage	Temperature (°F)
1	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
2	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
3	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80

## SECTION VII

### SURGE TEST

#### 7.1 TEST REQUIREMENTS

7.1.1 The test specimen shall be subjected to 25 pressure surge cycles while placed in the flexed position described in section IV.

7.1.2 Each pressure surge shall be a pressure increase from zero to 3000 psig in 100 milliseconds. This shall constitute 1 cycle. The test medium shall be GN<sub>2</sub>.

#### 7.2 TEST PROCEDURE

7.2.1 The test setup was assembled as shown in figure 7-1 and 7-3 using the equipment listed in table 7-1. All hand valves were closed.

7.2.2 The specimen was placed in the flexed position described in 4.2.2.

7.2.3 Regulator 7 was adjusted for zero outlet pressure.

7.2.4 Hand valve 5 was opened and the inlet port of regulator 7 was pressurized to 3500 psig with GN<sub>2</sub> from pressure source 2. The pressure was monitored on gage 6.

7.2.5 Solenoid valve 9 was actuated. The specimen was pressurized to 3000 psig by adjusting regulator 7. The pressure was monitored with transducer 10.

7.2.6 Solenoid valve 9 was deactuated and the specimen was vented to zero psig.

7.2.7 Solenoid valve 9 was actuated and the specimen was pressurized to 3000 psig. The pressure was monitored with transducer 10. Solenoid valve 9 was deactuated and the specimen was vented to zero psig.

7.2.8 The procedure described in 7.2.7 was repeated in an attempt to obtain a pressurization rate of zero to 3000 psig in 100 milliseconds.

7.2.9 Twenty-five surge cycles as described in 7.2.7 were performed.

#### 7.3 TEST RESULTS

The pressurization rate for the 25 cycles ranged between 102 and 118 milliseconds. Pressurization from zero to 3000 psig within the specified 100 milliseconds could not be attained because the teflon inner hose expanded and produced an irregular pressurization curve. This resulted in a pressurization

range rather than an exact time. Pressure rise rate within 100 milliseconds was zero to 2900 psig.

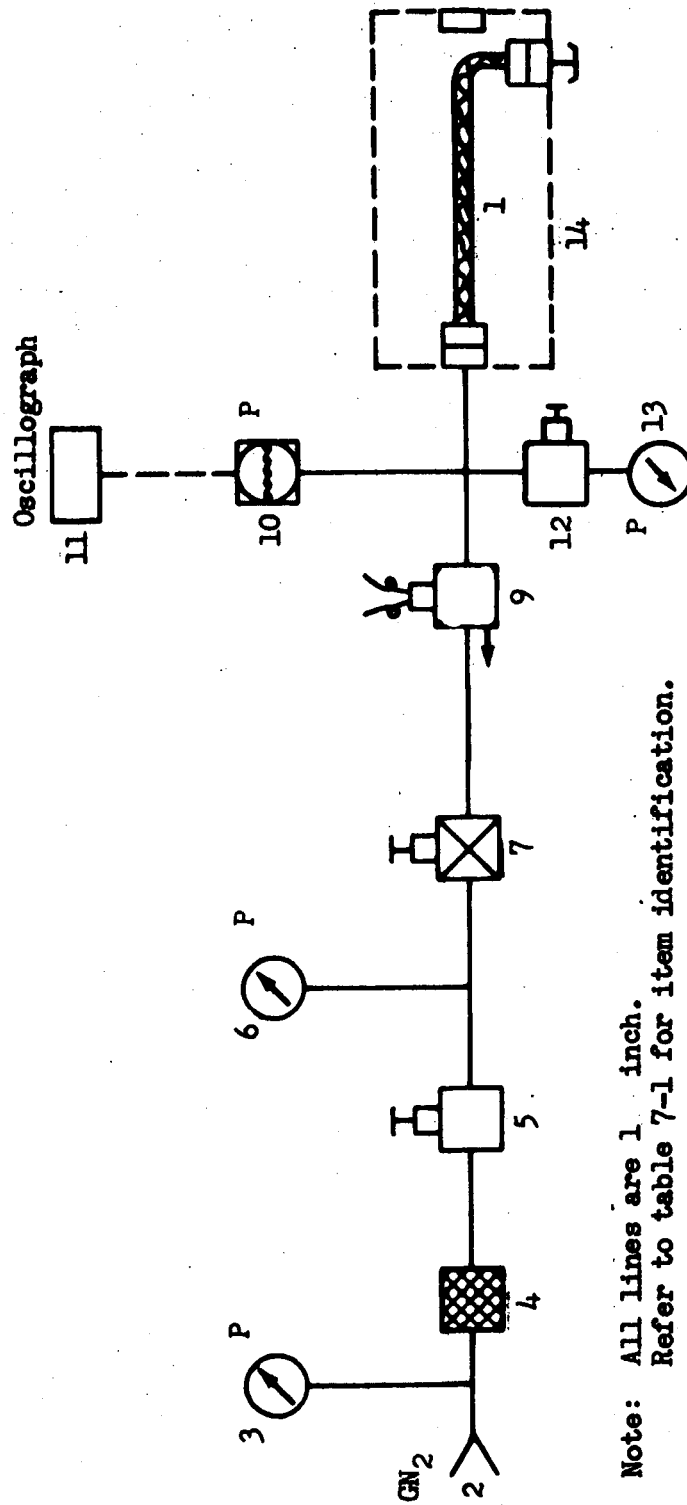
7.4

TEST DATA

Typical pressurization curves are shown in figure 7-2.

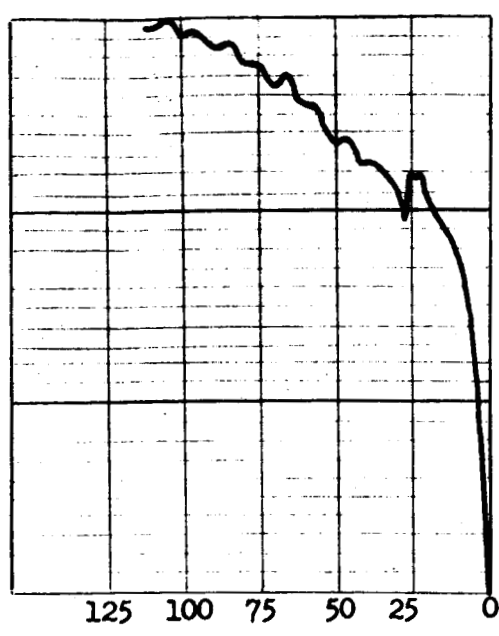
Table 7-1. Surge Test Equipment List

Item No.	Item	Manufacturer	Model/ Part No.	Serial No.	Remarks
1	Test Specimen	Aeroquip Corp.	AE700-48020	--	3/4-inch I.D. flex hose
2	Pressure Source	--	--	--	GN <sub>2</sub> 3500-psig
3	Pressure Gage	Ashcroft	--	--	0-to 5000-psig ±1.0% FS accuracy
4	Filter	--	--	--	10-micron
5	Hand Valve	Robbins Aviation Inc.	SSNA250-4T	--	1/4-inch
6	Pressure Gage	Ashcroft	--	20617-5	0-to 5000-psig ±1.0% FS accuracy
7	Pressure Regulator	Tescom Corp.	25-1003	322	
9	Solenoid Valve	Southwestern Valve Corp.	204274-1	115	1-inch, 3-way
10	Pressure Transducer	Consolidated Electrodynamics Corp.	--	2557	±0.5% accuracy
11	Oscillograph	Consolidated Electrodynamics Corp.	--	--	Recording
12	Hand Valve	--	--	--	1/4-inch
13	Pressure Gage	Heise	--	H358-33	0-to 3500-psig ±1.0% FS accuracy
14	Test Chamber	CCSD	--	--	

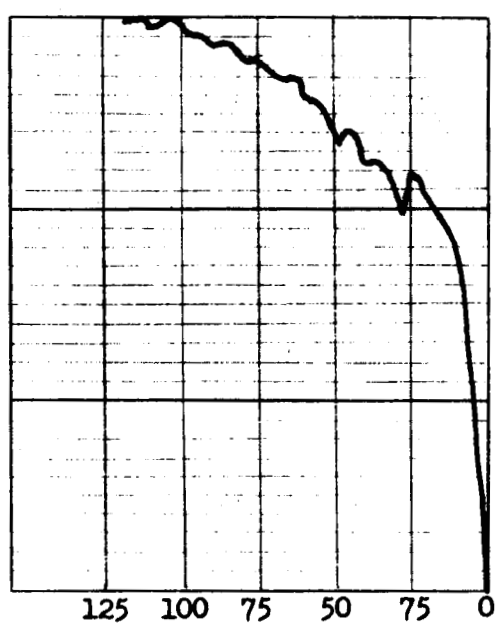


Note: All lines are 1 inch.  
Refer to table 7-1 for item identification.

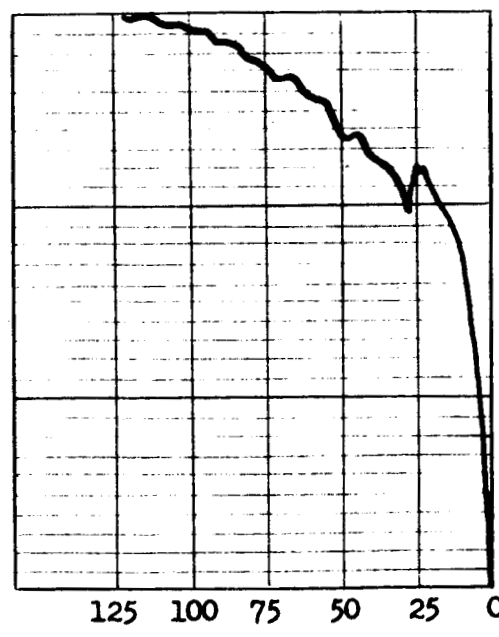
Figure 7-1. Surge Test Schematic



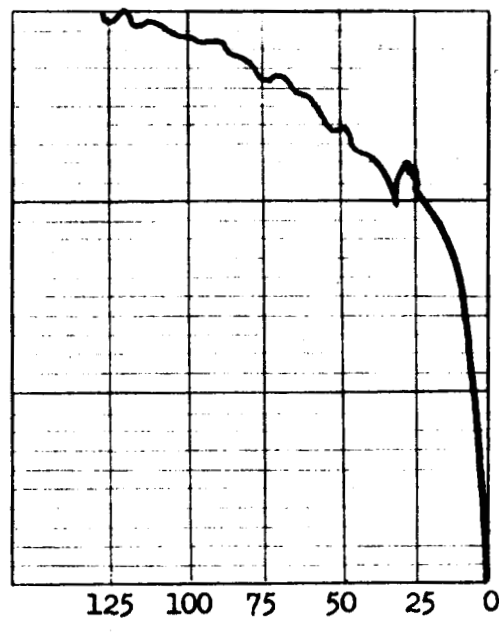
3000 psig  
2000 psig  
1000 psig  
0 psig



Time (Milliseconds)



3000 psig  
2000 psig  
1000 psig  
0 psig



Time (Milliseconds)

Figure 7-2. Surge Test Pressurization Curves



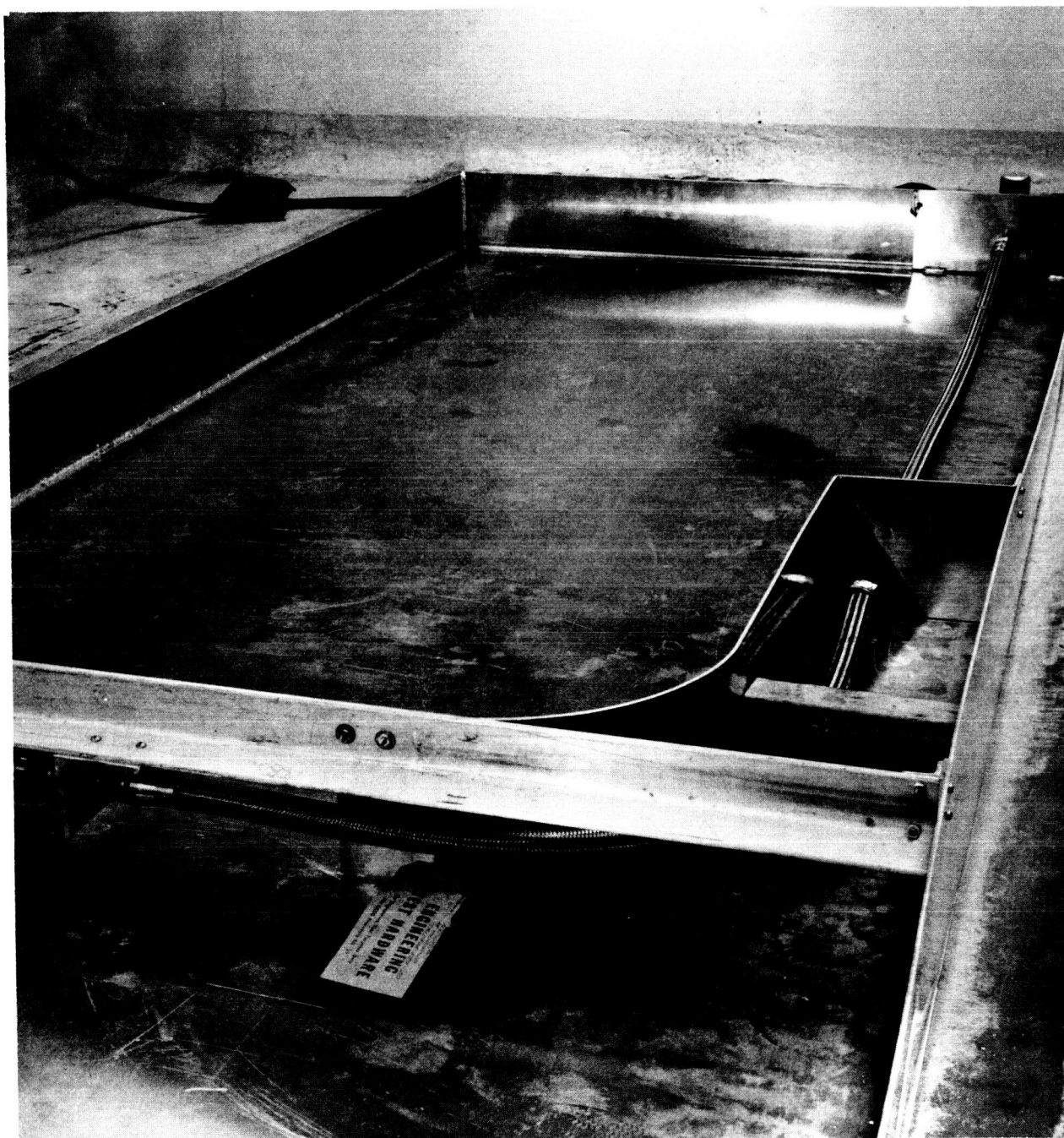


Figure 7-3. Surge Test Setup

## SECTION VIII

### CYCLE TEST

#### 8.1 TEST REQUIREMENTS

- 8.1.1 The test specimen shall be subjected to 1000 cycles.
- 8.1.2 Each cycle shall consist of moving the specimen from the extended position to the flexed position and back to the extended position.
- 8.1.3 A functional test as specified in section IV shall be performed following the completion of 50, 100, 500, and 1000 cycles.

#### 8.2 TEST PROCEDURE

- 8.2.1 The test setup was assembled as shown in figure 4-1, installation A, using the equipment listed table 4-1.
- 8.2.2 The specimen was bent 90 degrees from the extended position shown in figure 4-1, installation A, to the flexed position shown in figure 4-1, installation B, and then back to the extended position. This constitutes 1 cycle. One-thousand cycles were performed.
- 8.2.3 A functional test as described in section IV was performed after 50, 100, 500, and 1000 cycles.

#### 8.3 TEST RESULTS

The results of the cycle test and associated functional tests were satisfactory. No leakage was detected.

#### 8.4 TEST DATA

Data recorded during the cycle test are presented in tables 8-1, 8-2, 8-3, and 8-4.

Table 8-1. Functional Test Data Obtained After 50 Cycles

Trial No.	Position	Bend Radius (inches)	Pressure (psig)	Time (minutes)	Leakage	Temperature (°F)
1	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
2	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
3	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80

Table 8-2. Functional Test Data Obtained After 100 Cycles

Trial No.	Position	Bend Radius (inches)	Pressure (psig)	Time (minutes)	Leakage	Temperature (°F)
1	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
2	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
3	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80

Table 8-3. Functional Test Data Obtained After 500 Cycles

Trial No.	Position	Bend Radius (inches)	Pressure (psig)	Time (minutes)	Leakage	Temperature (°F)
1	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
2	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
3	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80

Table 8-4. Functional Test Data Obtained After 1000 Cycles

Trial No.	Position	Bend Radius (inches)	Pressure (psig)	Time (minutes)	Leakage	Temperature (°F)
1	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
2	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80
3	Extended	---	0	---	---	+80
	Flexed	8	3000	5	None	+80

## SECTION IX

### BURST TEST

#### 9.1 TEST REQUIREMENTS

- 9.1.1 The test specimen shall be subjected to a hydrostatic pressure of 12,000 psig for a period of 30 minutes.
- 9.1.2 The test specimen shall be checked for leakage and distortion.
- 9.1.3 The pressure shall be increased until failure (rupture) occurs. The location of failure shall be recorded and photographed, and the pressure at failure shall be recorded.

#### 9.2 TEST PROCEDURE

- 9.2.1 The test setup was assembled as shown in figures 3-1 and 3-2 using the equipment listed in table 3-1. All hand valves were closed.
- 9.2.2 Hand valve 4 and pressure cap 7 were opened. Hand pump 3 was operated to purge the system and specimen of air.
- 9.2.3 Pressure cap 7 was closed and the specimen was pressurized to 12,000 psig. The pressure was monitored on gage 5.
- 9.2.4 Valve 4 was closed and the pressure was maintained for 30 minutes.
- 9.2.5 The test described in 3.2.5 and 3.2.6 was performed.
- 9.2.6 The specimen was inspected for distortion. All data were recorded.
- 9.2.7 Valve 4 was opened and pump 3 was operated until specimen rupture occurred. The location of the failure and the pressure at failure were recorded. Figure 9-1 shows the failure.

#### 9.3 TEST RESULTS

- 9.3.1 There was no detectable leakage of the specimen during the initial pressurization. However, after 15 minutes of pressurization, a 50-psig pressure decay was observed. This was attributed to expansion of the teflon inner hose. The pressure was returned 12,000 psig and maintained for the remainder of the 30 minutes.
- 9.3.2 The overall length of the specimen after depressurization was 110-7/8 inches.
- 9.3.3 Specimen failure occurred at 19,500 psig. The failure was caused by the separation of an end fitting and collar from the hose. This end of the hose was flexed in previous tests.

TEST DATA

Data recorded during the burst test are presented in table 9-1.

Table 9-1. Burst Test Data

Pressure	12,000 psig for 30 minutes
Leakage	None
Distortion	+7/8-inches from original length
Burst Pressure	19,500 psig



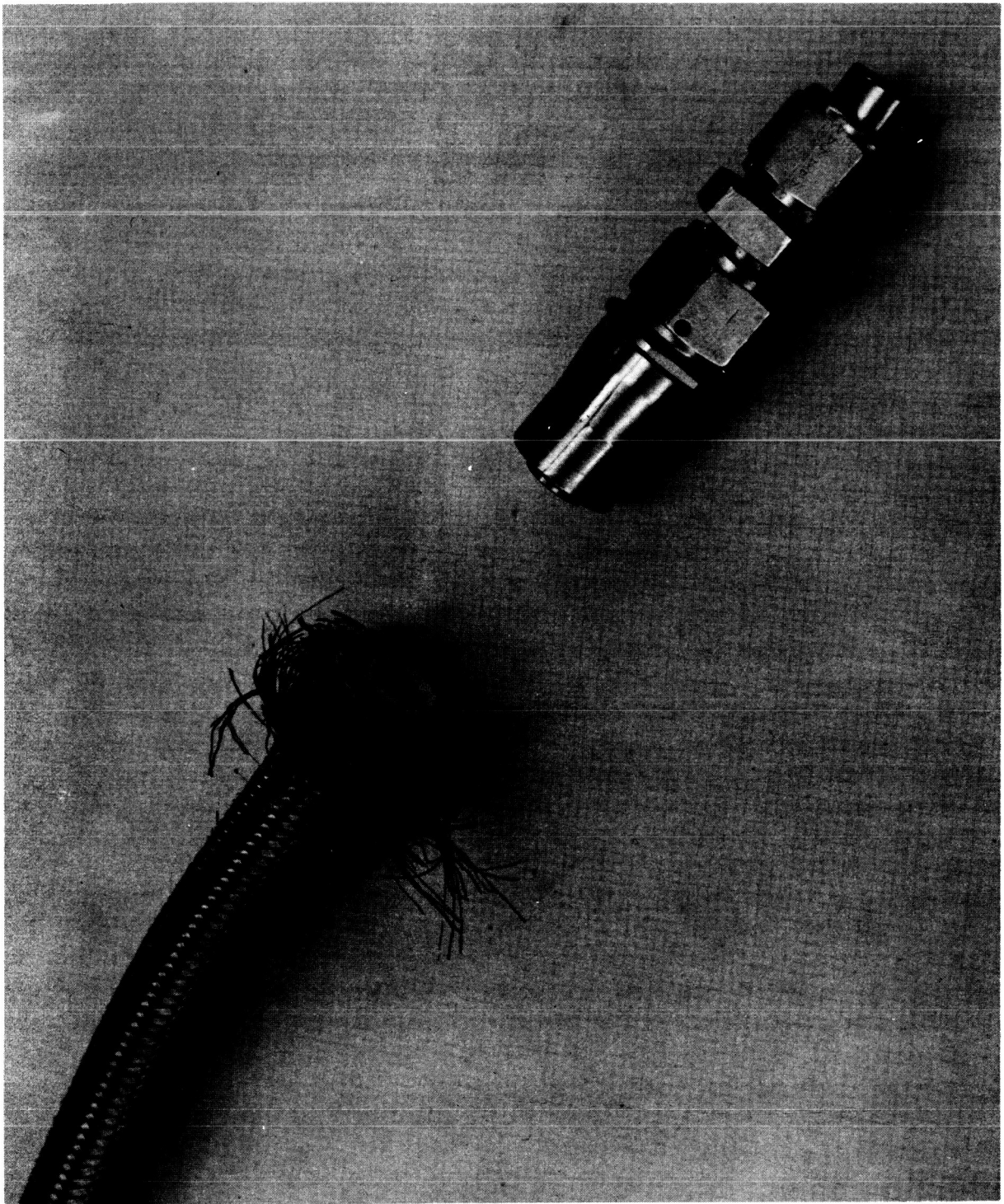
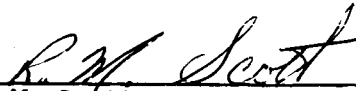


Figure 9-1. Burst Test Failure

APPROVAL  
TEST REPORT  
FOR

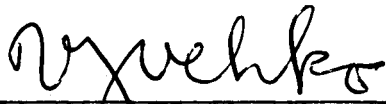
FLEXIBLE HOSE, 3/4-INCH I.D., 3000-PSIG  
Aeroquip Corporation Part Number AE700480-20  
NASA Part Number 75M12944 FFH-20

SUBMITTED BY:

  
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